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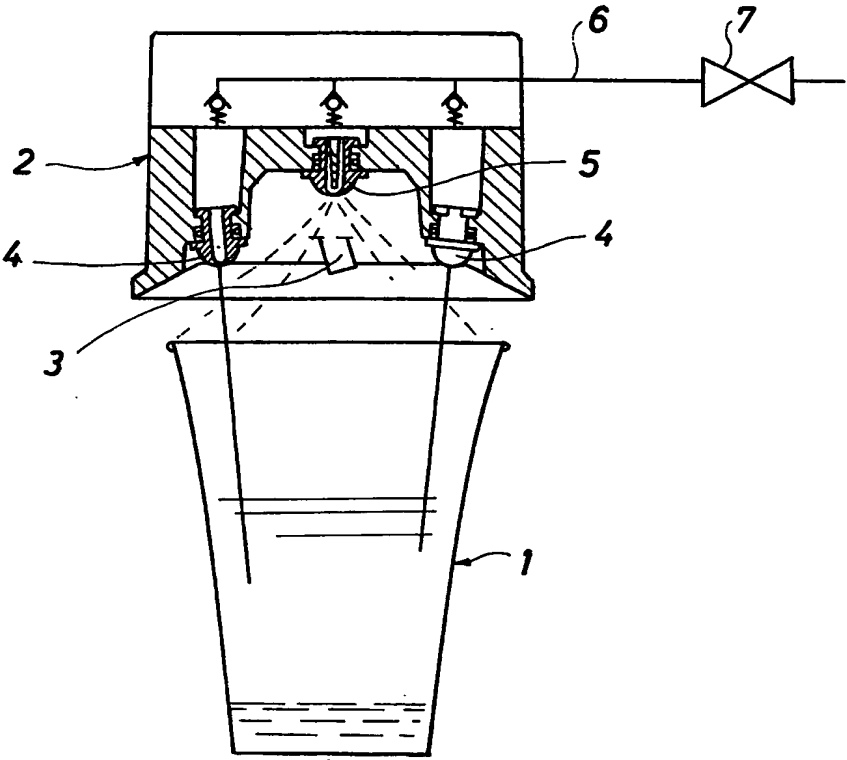
(54) **A method for preparing beverages in portions and a device for carrying out said method**

(57) A method and a device for preparing beverages such as coffee, tea and cocoa in portions in containers such as plastic cups, comprises first

partially filling a container of powdered beverage with a water is under slight over-pressure via a water outlet head (3) for partial filling of said container, and during which or immediately thereafter pressure water is added via separate nozzle heads (4). A spray of water may be used to rinse down any grains of powder.

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SPECIFICATION

A method for preparing beverages in portions and a device for carrying out said method

5 The present invention relates to a method for preparing beverages such as coffee, tea and cocoa in portions, by which method to a pre-measured amount of a flavored powder is added to a container, such as a plastic cup, whereafter the container is filled up with water, and a device for carrying out said method.

10 In known methods of preparing beverages in portions there are often problems involved in mixing to satisfaction the pre-measured amount of powder with the added water. Owing to the possibility of calcareous deposits in the pipes and in the water outlet openings, it has not been possible to solve this problem by increasing the pressure of the hot water.

20 The object of the invention is to provide a method for preparing beverages in portions, by which the pre-measured amount of powder is satisfactorily dispersed throughout and mixed in the added water so as to make maximum use of the capacity of the powder to be dissolved in a liquid.

25 This is achieved according to the invention by first filling the container partially with water under slight overpressure and by adding pressure water to the container while or immediately after the container is partially filled with water under slight overpressure for effectively mixing the liquid. By this means the pre-measured amount of powder is thoroughly dispersed throughout the added water, as the pressure water ensures thorough
35 "whipping" of the powder in the water. Particularly in connection with the preparation of hot beverages, the hot water may be added under slight overpressure without causing operational disorders owing to calcareous deposits, as the whipping effect is achieved by means of cold pressure water.

40 According to the invention the adding of water under slight overpressure may be interrupted or reduced temporarily during the adding of pressure water. By this means an appropriate embodiment of the invention is achieved.

45 According to the invention the water added under slight overpressure and/or the pressure water may be conducted in such a direction that the liquid in the container is caused to circulate, thereby increasing the effectiveness of the mixing.

The pressure water may according to the invention preferably be added under a pressure of approx. 3—4 kp/cm².

55 Furthermore the pressure water may according to the invention make up 5—25% of the total amount of added water. As a result the powder is dispersed to great satisfaction in the water. When preparing hot beverages, preferably 5—15% pressure water is added, in which case the cold pressure water does not cause the hot water, which is added under slight overpressure, to be cooled to any great extent.

Moreover according to the invention a foam-

65 subduing shower or spray of water may at the same time the pressure water is added and/or immediately thereafter be sprayed over the surface of the liquid and over any foam from the liquid that might be present in the container. As a result the formation of foam is greatly subdued during the preparatory process.

70 Furthermore according to the invention a shower or spray is sprayed over the surface of the liquid sufficient for rinsing down and dissolving any grains of flavored powder that might be present in the foam film so as to give the foam an appetizing, spotless appearance. As a result dissolution of the grains is expedited, a factor which is particularly desirable in the preparation of cold beverages.

80 The device for carrying out the method according to the invention comprises a container dispenser, a powder dispenser and a water supply means and is according to the invention characterized by a water outlet head having one or more water supply conduits for supplying water under slight overpressure, one or more water nozzle heads for supplying pressure water and a nozzle head for optional supplying of a shower or spray. By this means a device is achieved that is particularly well suited for carrying out the method according to the invention.

The nozzle heads may according to the invention be built in a single, replaceable unit. Consequently a device having a defective water outlet head can easily be made to function properly again by replacing the nozzle head.

According to the invention the water outlet head may have two nozzle heads for supplying pressure water, said nozzle heads being located diametrically opposite each other in relation to the central axis of the container and having a direction of outflow forming an angle of approx. 3—15°, preferably 12°, with vertical, and in vertical projection forming an angle of approx. 5—35°, preferably 25°, with a vertical plane extending through the center of the mouth of the two nozzle heads, the nozzle head discharging the spray being centrally located between the two nozzle heads situated diametrically opposite each other.

100 The water outlet head may according to the invention also contain two water supply conduits for supplying water under slight overpressure, the mouths of which are in the same way located diametrically opposite each other in relation to the central axis of the container and directed so that the outflowing water is made to circulate in the same direction as the direction in which pressure water is fed. As a result the preparation of the beverages is particularly fast and the powder is mixed thoroughly with the water resulting in quick dissolution of the grains.

105 The invention will be described below with reference to the drawing, which is a diagrammatic view of a vertical cross-section through a water outlet head in a device according to the invention while the device is filling a container with water by the method according to the invention.

The container 1 illustrated in the drawing in the

form of a plastic cup is positioned by means of a container dispenser under a water outlet head 2 which is part of a water supply means in a vending machine for preparing beverages such as coffee, tea and cocoa in portions. By means of a powder dispenser (not shown) the cup is provided with a desired, pre-measured amount of flavored powder, possibly already before the cup is positioned under the water outlet head 2. The water outlet head comprises a water supply conduit 3 for supplying water under slight pressure and two nozzle heads 4 for supplying pressure water. Furthermore it has a single centrally located nozzle head 5 adapted to spray a shower or spray over the surface of the liquid supplied to the cup by means of the nozzle heads 4 and the water outlet conduit 3. All the nozzle heads as well as the water supply conduit are connected to supply sources by known means. As illustrated in the drawing the nozzle heads may be provided with water from the same source via a conduit 6 and a suitable regulating valve 7. Another alternative is to provide the nozzle 5 for supplying a shower or spray with the necessary amount of water independent of the other nozzle heads, so that the nozzle head 5 is only in use during the preparation of beverages that have a tendency to produce a great amount of foam.

The control system of the device is adapted so that when the device is activated, the cup provided with a pre-measured amount of flavored powder is supplied with water under slight overpressure via the water supply conduit 3 together with pressure water via the nozzle heads 4. The amount of pressure water is relatively small in relation to the amount of water supplied under slight overpressure. When a hot beverage of approx. 150 ml is being prepared the pressure water may, for example, comprise 20 ml cold water. The pressure water may comprise 0—25% of the total amount of added water, depending upon the type of flavored powder, preferably 5—25% of the total amount. If a particularly foam-forming beverage is to be prepared, the control system of the device ensures that a spray of water is sent from the nozzle head 5.

In a preferred embodiment of the invention the water outlet head 2 has two nozzle heads 4 for supplying pressure water, the nozzle heads being located diametrically opposite each other in relation to the central axis of the container and having a direction of outflow forming an angle of approx. 3—15°, preferably 12°, with vertical and in vertical projection forming an angle of approx. 5—35°, preferably 25°, with a vertical plane extending through the center of the mouth of two nozzle heads. The nozzle head discharging the spray may be centrally located between the two nozzle heads situated diametrically opposite each other. The nozzle heads 4 for supplying pressure water may, however, be positioned in any other direction that causes the water in the cup to circulate. The nozzle head may also have several water supply conduits 3, and the direction of outflow of the conduits may also be adapted so that the water in the cup circulates as a result of

the direction of the water outflow.

The invention has been described with reference to a particular embodiment.

Many changes may be made without deviating from the spirit and scope of the invention as set forth in the appended claims. For instance, the nozzle heads and water supply conduits may be constructed in a single unit, thus facilitating the replacement of such a unit. Furthermore the control system of the device may be adapted so that a different number of nozzle heads and water supply conduits are coupled in, depending upon the type of beverage to be prepared.

Especially during the preparation of cold beverages, the grains of flavored powder become trapped in a film of foam, thus preventing the grains from being dissolved in the liquid. In order to avoid this, the control system of the device may be adapted to start a shower or spray when the preparation of such beverages is known to be encumbered with such a drawback. In such a case the amount of shower or spray may be adjusted to be sufficient for rinsing down and dissolving the grains in the liquid, while preserving the foam. As a result the prepared beverage has an appetizing, spotless appearance.

CLAIMS

1. A method for preparing beverages such as coffee, tea and cocoa in portions, by which method a pre-measured amount of a flavoured powder is added to a container, such as a plastic cup, whereafter the container is filled up with water, characterised in that the container is first partially filled with water under slight overpressure and in that while or immediately after the container is partially filled with water under slight overpressure, pressure water is added to the container for effective mixing of the liquid.

2. A method as claimed in claim 1, characterised in that the adding of water under slight overpressure is interrupted or reduced temporarily during the adding of pressure water.

3. A method as claimed in claim 1 or 2, characterised in that the water added under slight overpressure and/or the pressure water is conducted in such a direction that the liquid in the container is caused to circulate.

4. A method as claimed in claim 1, 2 or 3, characterised in that the pressure water is added under a pressure of approx. 3—4 kp/cm².

5. A method as claimed in claim 1, 2, 3 or 4, characterised in that the pressure water makes up 5—25% of the total amount of added water.

6. A method as claimed in claim 1, 2, 3, 4 or 5, characterised in that the same time the pressure water is added and/or immediately thereafter, a foam-subduing shower or spray of water is sprayed over the surface of the liquid and any foam from the liquid that might be present in the container.

7. A method as claimed in claim 6, characterised in that a shower or spray is sprayed over the surface of the liquid sufficient for rinsing down and dissolving any grains of flavoured

powder that might be present in the foam film so as to give the foam an appetizing, spotless appearance, a factor especially important in cold beverages.

- 5 8. A device for carrying out the method as claimed in claim 1, 2, 3, 4, 5, 6 or 7, comprising a container dispenser, a powder dispenser and a water supply means, characterised in that the water supply means comprises a water outlet
- 10 head having one or more water supply conduits for supplying water under slight overpressure, one or more water nozzle heads for supplying pressure water and a nozzle head for optional supplying of a shower or spray.
- 15 9. A device as claimed in claim 8, characterised in that the nozzle heads are built in a single, replaceable unit.
- 20 10. A device as claimed in claim 8 or 9, characterised in that the water outlet head has two nozzle heads for supplying pressure water, said nozzle heads being located diametrically opposite each other in relation to the central axis of the container and having a direction of outflow forming an angle of approx. 3—15°, preferably
- 25 12°, with vertical and in vertical projection forming an angle of approx. 5—35°, preferably 25°, with a vertical plane extending through the centre of the mouth of the two nozzle heads, and

- 30 in that the nozzle head discharging the spray is centrally located between the two nozzle heads situated diametrically opposite each other.

11. A device as claimed in claim 10, characterised in that the water outflow head contains two water supply conduits for supplying water under slight overpressure, the mouths of which are in the same way located diametrically opposite each other in relation to the central axis of the container and directed so that the out-flowing water is made to circulate in the same direction as the direction in which pressure water is fed.

12. A method for preparing beverages such as coffee, tea and cocoa in portions, by which method a pre-measured amount of flavoured powder is added to a container, such as a plastic cup, whereafter the container is filled with water substantially as described above with reference to the accompanying drawing.

13. A device for preparing beverages such as coffee, tea and cocoa in portions, by which method a pre-measured amount of flavoured powder is added to a container such as a plastic cup, whereafter the container is filled with water substantially as described above and shown in the accompanying drawing.

14. Beverage dispensing apparatus including a device as claimed in or operating by the method of any of claims 1 to 13.